

Index

- Achondroplasia, 162
- Acromegaly, 163
- Adaptations, 211–12
- Adenine, 21–22, 27, 113
- Adenosine diphosphate (ADP), 113
- Adenosine triphosphate (ATP), 72, 111–14
- Aging process, 28
- Albinism, 151
- Alleles, 81–82
- Allergies, 183–89
- Alternative splicing, 38
- Ambidextrous, 154
- Amino acids, 33–34, 40–41
- Androgen insensitivity syndrome, 94
- Autosomal chromosomes, 87–92

- Bacteria, 49, 60, 158, 220–21
- Baldness, 117–20, 209
- Base pairs, 21–22, 23, 27
- Bases, 21–22, 38
- Blood types, 121–25
- Brain, 191–93
- Breast cancer gene, 44–45, 92, 166
- Bubble Boy, 177–78

- Calcium channels, 193
- Cancer, 44–45, 89, 92, 105, 150–51, 165–68
- Celiac disease, 187–88
- Cells
 - dead, 26
 - discovery of, 64
 - division of, 65–66, 70–72
 - ownership of, 230–31
 - sex, 69–73
- Chase, Martha, 48–49
- Chlorophyll, 147
- Chromosome 21, 88, 92
- Chromosomes, 63–66, 70, 87–92. *See also* Sex chromosomes
- Codominance, 84–85
- Codons, 39–40, 53–54
- Colorblindness, 131–34, 139–42
- Common ancestry, 58
- Common cold, 183–84
- Comparative genomics, 223–25
- Complete proteins, 34
- Congenital adrenal hyperplasia, 90, 94–95
- Crick, Francis, 47, 50
- Cross-pollination, 76–77
- Cystic fibrosis, 172
- Cytosine, 21–22, 27

- Daltonism, 131–34
- Darwin, Charles, 212
- Deoxyribose, 20, 21, 22, 32
- Depression, 192
- De Vries, H.L., 140
- Dichromats, 139
- Diseases, 90–91
- Dizygotic twins, 207
- DNA (deoxyribonucleic acid)
 - genes, 43–45
 - genetic code and, 37–41
 - mitochondrial, 72–73, 113–15
 - noncoding, 59–62, 224–25
 - replication, 25–29, 65–66
 - scientific discoveries about, 47–51
 - sequence, 23, 233–35
 - storage of, 63–66
 - structure of, 19–24, 25, 28, 47, 49–50
 - viral, 180–81, 225
- Dominant genes, 77–78, 82–85
- Down syndrome, 88, 170
- Dust, 26
- Dwarfism, 161–63

- Earwax, 100–102
- Eggs, 69, 72, 78–79

Electromagnetic spectrum, 148–49
Endosymbiotic theory, 111
Environment, 105, 129, 203–05
Epigenetics, 186–87, 211–14
Essential amino acids, 33–34
Estrogen, 33
Eumelanin, 136, 145, 149
Evolution, 58, 223–25
Eye color, 100, 135–37

Fatal familial insomnia, 91–92
Food allergies, 185–89
Frame shifts, 54
Franklin, Rosalind, 49–51
Fraternal twins, 207
Free nucleotides, 27
Fruit flies, 215–17

Gametes, 69–73
Gene crossover, 95
Gene expression, 61–62, 83
Gene-naming conventions, 44–45
Genes

- about, 43–45
- alleles, 81–82
- combinations of, 103–05
- definition of, 38
- dominant, 77–78, 82–85
- duplicate copies of, 69–70
- environment and, 105, 129, 203–05
- non-protein coding, 61
- patents on, 227–31
- recessive, 77–78, 82–85, 119

Gene therapy, 237–41
Genetic code, 37–41
Genetic disorders, 91–92, 114, 169–72
Genetic mutations, 53–56, 113–14, 173–75, 224–25
Genetic research, 215–21, 227–31

Genetics
 future of, 237–41
 Mendelian, 78–79, 99–102, 103
Genographic Project, 234–35
Genome, 45, 57–58, 196
Gigantism, 161–63
Gluten, 187–88
Gray hair, 146
Guanine, 21–22, 27

Hair
 color, 145–46
 types, 143–45
Handedness, 153–55
Height, 159, 161–63
Hershey, Alfred, 48–49
Histone, 63
Hooke, Robert, 64
Hormones, 33, 93, 94
HUGO Gene Nomenclature
 Committee (HGNC), 45
Human Genome Organisation
 (HUGO), 45
Human Genome Project, 233

Identical twins, 207–10
Immortal jellyfish, 28–29
Immune system, 177–81
Incomplete dominance, 84–85
Inheritance, 76–79, 82–85, 99–102, 211–14
Introns, 38

Lacks, Henrietta, 230
Lactose, 220–21
Lactose intolerance, 188–89
Lamarck, Jean-Baptiste, 211–12
Law of independent assortment, 78–79
Law of segregation, 78–79
Left-handedness, 153–55

- Light waves, 148–49
- Lysine, 33
- Major histocompatibility complex (MHC), 178–79
- Malaria, 172
- Meiosis, 70–72, 75, 88
- Melanin, 136, 145, 147–51
- MELAS (mitochondrial encephalomyopathy), 114
- Mendel, Gregor, 76–79, 215
- Mendelian genetics, 78–79, 99–102, 103
- Mental illness, 191–93, 204
- Messenger RNA (mRNA), 32, 37–40
- Mice, 217–18
- Mitochondria, 72–73, 111–15
- Mitosis, 65–66, 72
- Molecular clock, 224
- Mutations, 53–56, 113–14, 173–75, 224–25
- Myopia, 127–30
- Nature vs. nurture debate, 203–05
- Nearsightedness, 127–30, 174–75
- Noncoding DNA, 59–62, 224–25
- Non-protein coding genes, 61
- Nucleotide, 22–23, 26–27
- Nucleic acid, 20
- Obesity, 157–58
- Overweight, 157–58, 214
- Patents, 227–31
- Personality, 195–99
- Phages, 48
- Pheomelanin, 136, 145, 149
- Phosphates, 21, 22
- Pigments, 147
- Polydactyly, 173–75
- Polyps, 29
- Prions, 91
- Proteins, 31–35, 47
- Protein synthesis, 39–40
- PTC strips, 109
- Radiation, 114
- Recessive genes, 77–78, 82–85, 119
- Replication, 25–29, 65–66
- Reproduction, 69–73, 75, 179–80
- Rh factor, 123–25
- Rh incompatibility, 124–25
- Rhinovirus, 183–84
- Ribose, 20, 31–32, 37–38
- Ribosomes, 39–40, 44
- Ricketts, 150–51
- Right-handedness, 153–55
- RNA (ribonucleic acid), 31–35, 44, 61
- Schizophrenia, 155, 192
- Severe combined immunodeficiency (SCID), 177–78
- Sex cells, 69–73, 78–79
- Sex chromosomes, 87, 93–96, 117–20
- Sex determination, 94–96, 118
- Sex-linked traits, 117–20, 131–32
- Sickle-cell disease, 171–72
- Sperm, 69, 72, 75–76, 78–79
- Stop codon, 40, 54
- Stress, 155, 214
- Sugars, 20
- Superseers, 139–42
- Taste receptors, 107–09
- Tay-Sachs disease, 172
- Telomeres, 28
- Testosterone, 33, 93, 94–95, 120
- Tetrachomats, 139–42
- Thymine, 21–22, 27, 38
- Traits
 - inheritance of, 76–79, 82–85
 - Mendelian, 99–102

Transcription, 66
Translation, 39
Trichomats, 139
Trisomy 21, 88, 170
23andMe, 234
Twin studies, 207–10
Type 2 diabetes, 172

Uniqueness, 13
Uracil, 38
UV (ultraviolet) rays, 149

Viruses, 47–49, 180–81, 225, 237–38
Vision
 colorblindness, 131–34, 139–42
 nearsightedness, 127–30, 174–75
 superseers, 139–42
Vitamin D, 150–51

Watson, James, 47, 49–50
Wavelengths, 148–49
Wilkins, Maurice, 49–50

X chromosome, 87, 93–96, 117–20
X-ray crystallography, 50

Y chromosome, 87, 93–96, 117–20
Yeast, 219

Zebra fish, 218–19
Zygote, 72